REMARKS

DRAWINGS

Proposed drawing corrections having Figures 1 – 3 designated by the legend – **PRIOR ART**— and Figure 3 amended to show the lead line for the reference numeral "**20**" shortened to point to the strip are submitted for approval. Formal drawings having the corrections will be submitted shortly.

ELECTION/RESTRICTIONS

With respect to the claim 7, Applicants elected with traverse in Paper No. 4 on the premise that claim 1, if allowed, would be generic and linking for claims 1 – 6, 7 and 8. It is believed consideration of claim 7 accordingly should occur in this application together with claims 1 – 6 and 8.

It appears product-by-process claims 18 – 21 were overlooked in Paper No. 3. Claims 18 – 21 are amended in this response to limit the battery plate to a paperless plate produced by the method of claim 1 or claim 8. It is believed claims 18 – 21 should be prosecuted with method claims 1 – 8 in that the product as claimed can only be produced by the said method claims.

REJECTION UNDER 35 USC §103(a)

In order to establish a *prima facie* case of obviousness,

- First, there must be some suggestion or motivation, either in the references themselves or in the knowledge possessed by one of ordinary skill in the art, to modify the reference(s) or to combine reference teachings;
- Second, there must be a reasonable expectation of success; and

- Finally, the prior art references must teach or suggest all the claim limitations [see MPEP §2142, citing In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991)].

REJECTION OF CLAIMS 1 – 6 AND 8

Claims 1 – 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art (see specification pages 1 – 4 and Figures 1 – 3), hereinafter AAPA, in view of Roberts et al., U.S. Patent 3,859,135.

It is acknowledged that AAPA illustrated in Figures 1 – 3 of the present application discloses a process of cutting expanded metal mesh strip which has been continuously pasted and coated on each side with a paper barrier. With reference to Figure 3, a lower paper barrier 22 is applied to the underside of expanded metal strip 10 before saturation with paste from paste hopper 18 and covering with an upper paper barrier 23. The paper barriers heretofore have been necessary to obviate sticking of the paste to the plate cutter dies 30 and anvil roll 34 (page 2, lines 2 – 6 and page 4, lines 15 – 28). As pointed out on to page 2, lines 6 - 17 of this application, many attempts have been made since the mid-1970s to eliminate the need for paper barriers because of cost considerations and numerous production problems, without success. The use of paper barriers added significant material costs to batteries and paper tearing and paper release from plates caused major production line downtime. The paper barriers on rejected plates caused bag house fires when recycled. Special die coatings and non-organic release agents were tried and failed.

Roberts discloses a method for the manufacture of battery plates in which individual plates travelling on a conveyor are overpasted with the assistance of a sonotrode 25 positioned over a heated support bar 24, such that the paste flows into and through the plate grid onto the support bar, leaving longitudinal ribs in the paste on the underside of the grid (col. 4, line 58 to col. 5, line 13). Bar 24 is heated to a temperature high enough to prevent sticking of the excess of paste to the semi-circular channels 46 formed on the upper side of support bar 24 (col. 9, lines 4 – 25). The upper surface of the overpasted plates is then levelled by means

of a heated doctor blade 72 and the plates inverted and passed by a second sonotrode 28 positioned over an unheated support bar 27, which has no channels, and by an unheated doctor blade 75 to smooth the ribs of paste prior to feed to an oven 29 (col. 10, lines 43 – 62).

Applicants respectfully submit that there is neither suggestion nor motivation in the cited references to combine their teachings for a *prima facie* case of obviousness.

It is stated in In re Rouffet, 149 F.3d 1350, 1357 (Fed Cir. 1998), "There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." It was held in this case that the combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obviousness was held improper.

Applicants' invention permits the elimination of paper barriers in the continuous manufacture of battery plates. Applicants have found that the incorporation of heating means in the cutting device used in continuous lead-acid battery plate manufacturing processes to permit heating and maintaining the cutting device at a predetermined elevated minimum temperature surprisingly prevents paste coming off pasted lead mesh and adhering to the tooling, notwithstanding penetration of the pasted lead mesh by the cutting blades of the cutting roll against an opposed anvil roll during a high-speed continuous operation.

Applicants have spent several years of intensive experimentation and the building of prototypes before successfully constructing and operating the method and apparatus of the present invention. Accordingly a person skilled in the art would not have had a reasonable expectation of success that the modification proposed by the Office, namely to heat the cutting device of AAPA, would render the cutting device satisfactory for its intended purpose of severing continuously pasted metal mesh strip without the presence of paper barriers.

AAPA does not teach or remotely suggest the use of heat to prevent adherence of paste to the tooling to avoid sticking of paste to the cutting blades which penetrate the pasted grid to sever the continuous strip into plates.

Notwithstanding a long-felt need for over 25 years, no-one has successfully constructed a method and apparatus for severing continuous pasted metal strip without the use of paper barriers on each side of the pasted strip.

Roberts discloses the use of a heated support beneath a sonotrode for ribbing the underside of an overpasted individual plate. A second support beneath a second sonotrode for smoothing the overpasted plate is not heated. Roberts likewise does not motivate the combination of the references to arrive at applicants' invention.

Claim 2 is limited to a temperature of at least 150°C, claims 3 and 5 are limited to a temperature range of about 160 to 300°C and claim 6 is limited to a temperature range of about 180 to 210°C. The Office suggests, and the applicants disagree, that applicants' temperature ranges are not more than optimum or workable ranges involving only routine skill in the art. Applicants submit, however, that there are recognized circumstances in which an optimisation of a variable, even if present, is not considered obvious. Two more prominent circumstances are where (1) the parameter optimized was not recognized to be a result-effective variable, and (2) the results of optimizing a variable, which was known to be result-effective, were unexpected good. *In re Antonie*, 559 F.2d 618 (CCPA 1977).

It was found that the minimum die temperature required to prevent sticking of battery paste to the cutting dies must be above about 150° and below the melting point of the lead alloy of the battery plates, preferably 160 to 300°C, and more preferably 180 to 210°C. Die temperatures below 150° were not effective due to battery paste sticking to the die surfaces (page 6, line 26 to page 7, line 8, particularly page 7, lines 1 and 2).

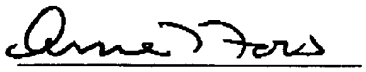
Roberts discloses a range of 120 to 300°C, which includes the range of 120 to 150°C which applicants have found to be inoperative. Applicants' temperature ranges accordingly are believed distinguished over the Roberts range.

REJECTION OF CLAIM 5

Claim 5 additionally comprises an index mechanism not disclosed in the cited prior art. In any event, in that claim 5 depends on claim 4 in turn dependent on claim 1, which are believed to be patentable over the cited art, it is submitted that claim 5 is also patentable.

For the above reasons, it is respectfully submitted that claims 1 – 6 and 8, claim 7 and claims 18 - 21 are patentable over the combination of cited references. Favourable consideration of the application and allowance of claims 1 – 8 and 18 - 21 accordingly are earnestly solicited.

Respectfully submitted,
Marlow, et al.



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